Initial Issue:

- During performance of the "SRSS Interface Test" – "Orbiter Arm Light Verification" section of S5009, the GSE Command to issue the RH A Command Receiver/Decoder (CRD) Inhibit was not issued as expected. IPR 119V-0047 was initiated to document the problem.

- Analysis of the BRSS software set revealed that the GOAL program used contained hidden cursor targets which, if selected, have the potential to perform unexpected operations.

- A full review of all ASWT software sets was initiated to identify any other occurrences of hidden cursor targets and to determine their effect on Firing Room operations.

Status:

- The highest priority was placed on software programs used during S0007. This review was completed prior to the STS-119 S0007 Call to Stations. The BHYD, ECLS, GNC, and SRSS systems had potential impacts to operations. The specifics of those impacts were identified and detailed presentations were provided to the IDS CCB for acceptance of NFLT rationale and workaround statements. Data was also forwarded to ERB.

- Risks for all of the S0007 impacts were Green.

- The review of all remaining GOAL software programs has been completed with all of the risks for those occurrences also being identified as Green.

- A team comprising both USA and NASA software personnel has been established, and meets on a regular basis, to monitor the progress for all identified non-conformances of hidden cursor targets and track them through completion.

Status (cont):

- The following systems reported occurrences of hidden cursor targets in their non-S0007 GOAL software and have initiated non-conformances (all with NFLT constraints) to document/correct their software: COMM/NAV, DPS, ECLS, EPDC, GNC, OS, SRSS.

- The following systems reported occurrences of hidden cursor targets, but the software behaved as expected and there were no non-conformances opened: DPSME, GLS, INST, LO2/LH2, MECH, MPS/SSME, MSTR, PRSD.

- The following systems reported having no occurrences of hidden cursor targets: APU, ARMS, ECS, HGDS, HYD, INTG, OMS, PLDTEST, and RMS.

- Each ASWT has prioritized its non-conformances and plans to work them as expeditiously as possible, with the exceptions of DPS and GNC.

- The DPS ASWT desires to close both occurrences of GOAL programs on their non-conformance as acceptable as is, No Fix Required (NFR).

- The GNC ASWT has placed the highest priority on working their S0007 programs first. Multiple AppSw developers have been assigned to work these items as expeditiously as possible. At this time the team would like to close one of the non-S0007 non-conformances as acceptable as is (NFR). The remaining non-S0007 items will each be addressed at a later time.

DPS Position:

- The DPS ASWT has identified the following instances of a non-conformance (NC044240-A01) that they desire not to correct and to close as acceptable as is (NFR):

  - VAB99 (BTU PROM Read/Dump) – This program executes in standalone mode. It provides the operator the option to perform an MDM PROM read and compare based on operator input.

  - Scenario – Operator selects PROM dump on any/all MDMs prior to program completing initialization.

  - Worst Case Effects:
    - Program error stops while attempting to write PROM data to Page-A and SPA Printer due to invalid line/column coordinates
    - Results of PROM data read are lost (output report unreadable)
    - IPR may be opened due to unexpected program operation
    - **No unintended vehicle commanding or hazardous condition will result**

  - Operator Response Options:
    - Notify LPS of program Error Stop (Standard Procedure)
    - Resume Program – Will continue to Error Stop until Line/Column pointer increments to a legal value
    - Hard terminate the program and re-perform task correctly, or utilize alternate program, VSSD5, to perform the same task
    - Retrieve Lost PROM Data (QLDB/$SPLDUP)

DPS Position (cont):

- VAS57 (GPC/BTU Interface Test) – This program executes in standalone mode. This program provides the operator the capability to perform the onboard GPC/BTU interface test from the ground via DEU equivalents transmitted up the LDB. The program allows the user to check GPC/BTU readiness by cursor transmission on one, many or all BTUs on three different levels:

- Scenario – Operator selects a BTU I/F Test on a BTU prior to program completing initialization.
  - Requires program to first fail configuration checks during initialization (Ops mode, LDB/DL status, IDP power/Maj Func)

- Worst Case Effects:
  - If IDP3 is powered up in GNC, program will error stop during attempt to initiate test due to invalid IDP equivalent target (IDP 0)
  - If IDP3 is not powered up in GNC, program will report error IDP equivalent target error message and wait for operator to correct
  - IPR may be opened due to unexpected program operation
  - **No unintended vehicle commanding or hazardous condition will result**

- Operator Response Options:
  - Notify LPS of program Error Stop (Standard Procedure)
  - Resume Program – Will continue to Error Stop until LAST Kybd Equiv sent
  - Terminate or restart the program and re-perform task correctly

DPS Position (cont):
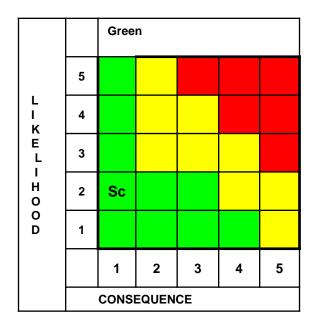
Risk to Close as NFR

		Green				
L I K E L I H O O D	5					
	4					
	3					
	2	Sc				
	1					
		1	2	3	4	5
			CONSEQUENCE			

Risk Statement
DPS console engineer selects a VAB99 or VAS57 program test option prior to program completing initialization.

Risk Context
Cursor targets are not hidden, but are active prior to program completing initialization.

Likelihood (Score: 2)
Low. Programs are contingency use only, used for MDM troubleshooting purposes. Program prompts operator for correct inputs.

CONSEQUENCES
Schedule (Score: 1 - Green)
Minor operational impact possible due to delay in troubleshooting while problem is investigated.

Safety (Score: N/A)
Mission Success: (Score: N/A)
Supportability: (Score: N/A)
Cost of Recovery (Score: N/A)

GNC Position:

Risk to Close as NFR

- The VSB54 work item on the following non-conformance (NC043097-A01) has been identified by the team to be closed as Acceptable As Is (NFR):

  - VSB54 (RCS Driver/P.C. Test) – This program is used to perform testing on a brand new OMS pod. Thus, it is not expected to be used again. VSB54 has numerous hidden cursor targets which are always active. 2 menu displays, 1 with 45 cursors, 1 with 11 cursors. The operator could select a hazardous target, however, the software has logic that will prevent it from acting on the request.The PFKs are always active as well. Selection of PFK1-5 or PFK8 when the cursor menu is displayed will clear the page. The page will remain blank and thus the operator must select PFK15 to terminate the program. The software can then be re-initiated and the test selection reselected. This cannot occur in the middle of a test, only prior to a test being started.

  - The ASWT will place this anomaly into their "Funny Item List" which is reviewed on a regular basis. If the situation arises in which this program were needed in the future, the team would re-address with operators at that time.

  - All risks are 1/1 if this program being closed as NFR.

C,M,S,Sc

+ - Safety, C – Cost, S – Supportability
M – Mission Success, Sc – Schedule

Summary:

- Application Software has reviewed all GOAL software for any occurrences of Hidden Cursor Targets and PFK's/PFPK's that remain active outside of their planned operational usage.

- 25 NC's have been opened to document those instances that do not adhere to the new redlines incorporated into the Software Display Standards (80K00010).
    - GOAL interrupts associated with a cursor control point (XMIT, DISARM, EXEC) shall only be active when the cursor target is displayed to the CRT.
    - If the GOAL software manages the cursor target interrupt even when it is not displayed (e.g., displays a message to the operator indicating an invalid selection was made, checks configuration variables to determine validity of the selection, etc.), then the GOAL interrupts for the cursor control point may remain active.
    - If the GOAL software does not manage the cursor control point interrupt to account for when the target is not displayed to the CRT, all GOAL interrupts associated with the target shall be inhibited.

- Available AppSw personnel have been assigned to work the NC's as expeditiously as possible.

- At this time BHYD has completed their NC (NC042849-A01), ECLSS has completed their highest priority NC (NC043543-A01) and SRSS has partially completed one of their NCs (NC042524-A02).

- A team comprised of USA and NASA software personnel was established and will continue monitoring the progress of all NC's through their closure.

<u>Summary (cont):</u>

- The DPS ASWT requests concurrence to close their identified instances in NC044240-A01 as Acceptable As Is (NFR).

- The GNC ASWT requests concurrence to close the VSB54 instance in NC NC043097-A01 as Acceptable As Is (NFR). All remaining GOAL program instances on this NC will remain open. As the remaining non-S0007 NC's are evaluated, any additional instances that the team feels are Acceptable As Is will be brought before CCB for concurrence at that time.

BACKUP CHART

Microsoft Excel
Worksheet